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Effect of Yoga therapy with sattvic diet on endometrial thickness among reproductive girls suffering with polycystic ovary syndrome

G. Nalini

Fulltime Ph.D. Scholar in Yoga, Faculty of Yoga Sciences and Therapy, Meenakshi Academy of Higher Education and Research, West K.K. Nagar, Chennai-78, Tamil Nadu, India

Email: ngovin123@gmail.com

Dr. R. Elangovan

Professor & Head, Faculty of Yoga Sciences and Therapy, Meenakshi Academy of Higher Education and Research, West K.K. Nagar, Chennai-78, Tamil Nadu, India

Email: relangovantnpesu@gmail.com

Abstract---The aim of the random group experimental study was to find the effect of yoga therapy with sattvic diet on endometrial thickness among reproductive girls suffering with Polycystic Ovary Syndrome. To achieve the purpose of the study, 45 were screened using Rotterdam Criteria and 30 were finally selected randomly by using randomized control sampling method. It was hypothesised that there would be significant differences on endometrial thickness due to yoga therapy with Sattvic Diet than the control group. The subjects (30) were divided into an experimental group (Yoga Therapy with Sattvic Diet) and control group of 15 subjects each. Experimental group was imparted training for 24 weeks, six days a week and the control group was in active rest with their regular activities. The pre-test and post-test were conducted before and after the intervention for the experimental and control group and the scores on endometrial thickness was measured. Analysis of covariance (ANCOVA) was used to find out the significant differences among the groups. The result of the study showed that estrogen dominance was stabilized and there were significant differences on Endometrial thickness (increased in Ovulatory phase) and (decreased during menstrual cycle) with the regular ovulation and monthly menstrual cycle along with the responsive progesterone level as a result of Yoga Therapy with Sattvic Diet in the experimental group. Also in Experimental group, it was observed that three subjects were fertilized. Hence the hypothesis was accepted at 0.05 level of confidence. The conclusion was that the Yoga therapy with Sattvic Diet is essential for regular menstrual cycle and

fertilization among reproductive girls suffering with Polycystic Ovary Syndrome.

Keywords---endometrial thickness, yoga therapy, sattvic diet, polycystic ovary syndrome.

Introduction

Reproductive girls with polycystic ovary syndrome (PCOS) are a genetic, endocrinal and reproductive disorder. It is characterized clinically by oligo-ovulation or anovulation, hyper-androgenism, and the presence of polycystic ovaries. Hormone Imbalances (LH FSH ratio, Estrogen, Testosterone and Progesterone) are more common across the Polycystic Ovary Syndrome affected reproductive girls which is the major cause for hyperandrogenism and anovulation. Estrogen(E2) is one of the important female hormones which is the main cause for irregular menstrual cycles and infertility among the reproductive girls suffering with Polycystic Ovary Syndrome due to Estrogen(E2) dominance or low aromatization of Estrogen. Estrogen is the hormone mainly affected with the disturbances of FSH secretion, Poor Circadian rhythm, Imbalanced high glycemic diet and more stress level including hypothyroidism and insulin resistance. Estrogen(E2) Dominance with unresponsive progesterone is the one of the reasons for endometrial thickness with irregular menstruation. Even though the bottom cause is ovulatory dysfunction or hyperandrogenism due to improper granulosa cells responses, LH dominance and FSH inhibition or insulin resistance. The most of the Polycystic Ovary Syndrome affected girls suffered with endometrial thickness > 11 mm after 45 days of menstrual cycle. It is mandatory to regulate the hormones either from HPO axis or from bottom down approach to stimulate the hormones in the balanced way.

Yoga Therapy with Sattvic Diet is the set of modified yogic practices according to the individuals along with the sattvic diet. Yoga Therapy which helps to balance the proper blood flow to reproductive organs and massages the organs. This in turn stimulates the ovaries and helps to stabilize the estrogen level(E2) and stimulates the ovulation and progesterone secretions. From the bottom-up approach, HPO axis will be stimulated and helps to balance neuro endocrine function and circadian rhythm along with parasympathetic activation. Sattvic foods are considered the most nutritious, and are associated with a high intake of micronutrients. Sattvic diets are rich in fresh, nutrient-dense foods, including fruits, vegetables, sprouted whole grains, fresh fruit juices, legumes, nuts, seeds, honey, and herbal teas. It promotes longevity, calmness and weight loss along with physical and mental health. It acts as antioxidants and helps to remove visceral fat and balances the insulin and glucose level in the system.

Objectives of the study

The objective of the study was to find out whether there would be any significant difference on endometrial thickness due to Yoga therapy with Sattvic Diet among reproductive girls suffering with Polycystic Ovary Syndrome.

Purpose of the study

Menstrual irregularity and infertility are the most common problem faced by the women suffering with Polycystic Ovary Syndrome. The purpose of the study was to find out an effect of Yoga therapy with Sattvic Diet on endometrial thickness among reproductive girls suffering with Polycystic Ovary Syndrome.

Hypothesis

It was hypothesized that there would be significant differences due to Yoga therapy with Sattvic Diet on endometrial thickness among reproductive girls suffering with Polycystic Ovary Syndrome than the control group.

Delimitations

- The study was confined to 30 Polycystic Ovary Syndrome affected reproductive girls aged between 20 and 24 years only.
- The study was delimited to the Polycystic Ovary Syndrome affected reproductive girls residing in Chennai city only.
- The study was delimited to 24 weeks only
- The independent variable was Yoga Therapy with Sattvic Diet only

Limitations

- The factors like Socio – Economical and marital status were not taken into consideration.
- The climatic conditions were not considered.
- Factors like life style habits and medications were not taken into consideration.
- Subject's day to day activities were not taken into account.
- Hypothyroidism subjects were excluded from the study.
- Yoga therapy with sattvic diet group would be given diet chart and instructions only would be given to follow diet pattern during the experimental period. Personal verification would be considered as a limitation.

Reviews of related literature

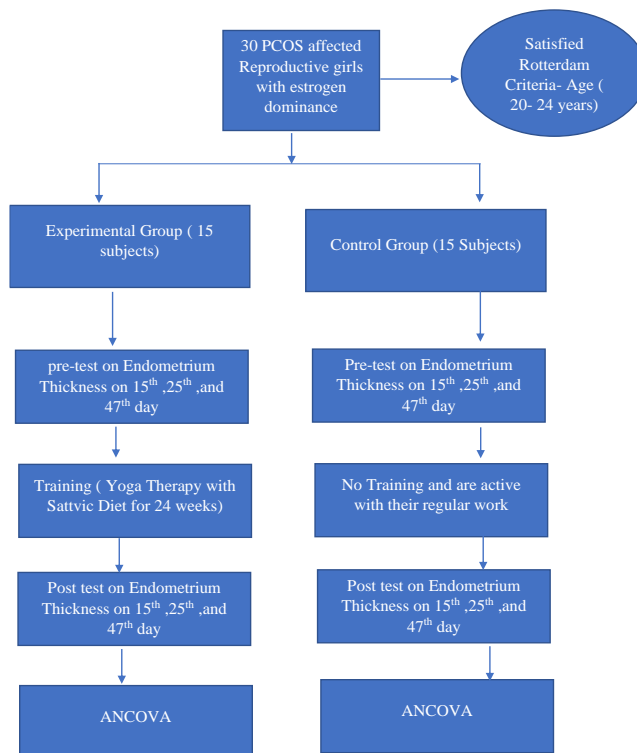
Nidhi R et.al., (2013) conducted the study to observe the effects of a holistic yoga program on endocrine parameters in adolescents with polycystic ovarian syndrome: a randomized controlled trial. The objectives of this trial were to compare the effects of 9 a holistic yoga program with the conventional exercise program in adolescent polycystic ovarian syndrome. Ninety (90) adolescent (15-18 years) girls from a residential reproductive in Andhra Pradesh who satisfied the Rotterdam criteria were randomized into two groups and 12 weeks (1 hour per day) of Yoga & Physical Exercises were given part of intervention. They concluded from the study that a holistic yoga program for 12 weeks is significantly better than physical exercise in reducing AMH, LH, and testosterone, mFG score for

Hirsutism, and improving menstrual frequency with non-significant changes in body weight, FSH, and Prolactin in adolescent PCOS.

Laura A et.al., (2015) concluded the study to observe the effect of prolactin on SNAT2 expression, they incubated MG explants or T47D cells transfected with the SNAT2 promoter with prolactin, and observed in both studies an increase in the SNAT2 expression or promoter activity. Consumption of a high-protein/low carbohydrate diet increased prolactin concentration, with a concomitant increase in SNAT2 expression not only in the MG during lactation, but also in the liver and adipose tissue. There was a correlation between SNAT2 expression and endometrial thickness depending on the amount of dietary protein/carbohydrate ratio consumed. These findings suggest that prolactin actively supports lactation providing amino acids to the gland through SNAT2 for the synthesis of milk proteins.

Methodology

To achieve the purpose of the study, 60 Polycystic Ovary Syndrome affected Reproductive girls aged between the 20 and 24 years came forward from Chennai city, 45 were screened using Rotterdam Criteria and 30 were selected randomly by using randomized control sampling method and they were divided into two groups I and II with 15 subjects in each group. Preliminary test was conducted for the two groups (I and II) on the endometrial thickness on the 15th day, 25th day and 47th day using ovarian follicular study before the start of the training program. Group I (experimental group) subjects were given Yoga therapy for 6 days a week for the period of 60 minutes of total 24 weeks duration along with Sattvic Diet.



Training Schedule Includes,

Yoga Therapy (6 days a week per month for six months)	Tadasana, Surya Namaskar Variations, Trikonasana, Virabhadrasanam II, Parsva Konasanam, Prasrita Padoutthanasanam, Parivritti Trikonasanasnam, Uttanasanam, Diwipadapidam, Prasrta Padoutthanasanam, Apanasanam, Suptha Baddha Konasanam, Sukhasana, Janu Sirsasanam, Pascimottanasanam, Badhakonasanam, Upavista Konasanam and Relaxation with breath observation. Pranayama practices such as Ujjai, Nadi shodana and Bhramari Pranayama were given to group
Sattvic diet (1400 Calories)	Beetroot juices, Turmeric water, drumstick leaves, Banana Flower, Soups, Millets, fruits, vegetables, sprouted whole grains, legumes, nuts, seeds, honey, and herbal teas. the diet plan contains more fibre, gluten free and Vitamin B6 rich foods.

Group II (Control Group) subjects were permitted to undergo their routine and normal lifestyle during the course of experiment without any specific training. After 24 weeks, the two groups were retested again on the Endometrial thickness. Analysis of Co-Variance (ANCOVA) was used to find out the significant differences between experimental group and the control group. The test of significance was fixed at 0.05 level of confidence.

Results and Discussions

The data pertaining to the variable collected from the two groups before and after the training period were statistically analysed by using Analysis of Co-variance (ANCOVA) to determine the significant difference and the hypothesis was tested at 0.05 level of confidence. These are shown in the Tables below

Results of endometrial thickness

Table I
Computation of Analysis Covariance on Endometrial thickness in Experimental Group and Control Group (mm) -Ovulatory Phase

MEANS	YOGA THERAPY WITH SATTVIC DIET (GROUP-A) (mm)	CONTROL GROUP (GROUP B)	SV	SS	df	MS	F
PRE-TEST	8.10	9.02	A	9.02	1	9.02	18.40
			W	13.73	28	0.49	
POST TEST	12.01	8.32	A	102.05	1	102.05	281.34*
			W	10.16	28	0.36	
ADJUSTED POST TEST	3.91	-0.70	A	70.26	1	70.26	186.88*
			W	10.15	27	0.38	

*Significant at 0.05 level of confidence (Table F-ratio at 0.05 level of confidence for 1 and 28 (df)=4.20, 1 and 27(df)=4.21)

The obtained F value 186.88 was greater than the required F value of 4.20. This proved that there was a significant difference among the means due to 24 weeks of Yoga Therapy with Sattvic Diet on Endometrial thickness among Reproductive girls suffering with Polycystic Ovary Syndrome with regular ovulation and monthly menstrual cycle in line with the study conducted by Nidhi R et.al., (2013) and Laura A et.al., (2015). Taking into consideration the pre and post test scores among the groups, adjusted mean scores were calculated and subjected to statistical treatment. The ordered adjusted means on Endometrial thickness was presented through bar diagram for better understanding of the results of this study in Figure - I.

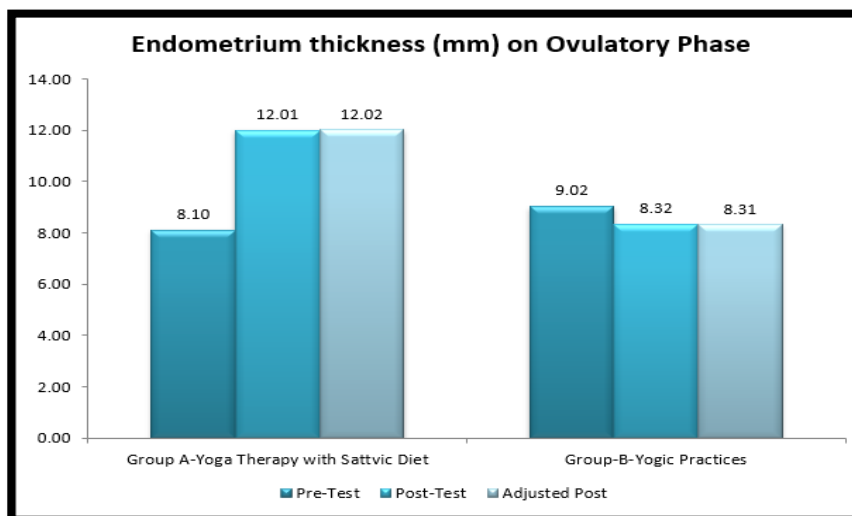


Figure I. Graphical Representation on Pre-Test and Post-Test on Endometrial thickness of Experimental Group and Control Group (mm)

Discussion on hypothesis

It was hypothesized that there would be significant differences on Endometrial thickness due to Yoga Therapy with Sattvic Diet among Reproductive girls suffering with Polycystic Ovary Syndrome than the control group. The results proved that there were significant differences on Endometrial thickness (increased in Ovulatory phase) and (decreased during menstrual cycle) with the regular ovulation and monthly menstrual cycle due to Yoga Therapy with Sattvic Diet than the control group among reproductive girls suffering with Polycystic Ovary Syndrome.

Conclusion

It is concluded that Yoga Therapy with Sattvic Diet significantly increased Endometrial thickness during ovulation phase and decreased during menstrual cycle with the regular ovulation and monthly menstrual cycle among Reproductive girls suffering with Polycystic Ovary Syndrome. Hence, Yoga Therapy with Sattvic Diet are beneficial for reproductive girls suffering with Polycystic Ovary Syndrome to maintain regular menstrual cycles and to overcome infertility related problems.

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